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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,414	07/01/2005	Gerard De Haan	NL 030045	7640

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EXAMINER
ROBERTS, JESSICA M

ART UNIT	PAPER NUMBER
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,414	DE HAAN, GERARD	
	Examiner	Art Unit	
	JESSICA ROBERTS	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 0205*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/04/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because of undue length. Correction is required. See MPEP § 608.01(b).

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim(s) 1-2 and 14 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example the method for recursively estimating local vectors including the steps of "generating a first set", "selecting candidate vectors", "evaluating the candidate", "determining the best vectors", "assigning said determined best vectors" is off sufficient breadth that it would be reasonably interpreted as a series of steps completely performed mentally, verbally, or without a machine.

The Applicant has provided no explicit and deliberate definitions to tie the method which includes the steps of "generating a first set", "selecting candidate vectors", "evaluating the candidate", "determining the best vectors", "assigning said determined best vectors" to limit the steps to a particular apparatus or machine.

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

Regarding claim 14, which recites a computer program product directly loadable into the internal memory...", which qualifies as. However, the disclosure or specification does not define or limit the computer program product from non-statutory subject matter (i.e., signals). Thus, claim 14 is rejected under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-7, 10, 13 are rejected under 35 U.S.C. 102(b) as being anticipated by de Haan et al., *An Efficient True-Motion Estimator Using Candidate Vectors from a Parametric Motion Model.*

Regarding claim 1De Haan teaches method for recursively estimating local vectors from at least one picture taken from an image sequence, comprising the steps of generating a first set of candidate vectors under at least partial use of recursion (abstract, I. Introduction), selecting candidate vectors from the first set of candidate vectors according to a first criterion to form a smaller second set of candidate vectors (More formally, CS^{max} is defined as the set of candidates $\underline{C}$, describing all possible (usually integer) displacements with respect to $\underline{X}$ within the search area SA ($\underline{X}$) i the previous image, see, Fig. 1 illustrates the procedure. II. THE 3-D RECURSIVE

SEARCH BLOCK MATCHER, p. 85) evaluating the candidate vectors of the second set of candidate vectors for a group of pixels based on a second criterion (The error value for a given candidate $\underline{C}$ is a function of the luminance values of the pixels it he current block and those of the shifted block from a previous field, summer over the block $B(\underline{X})$. A common choice, which we will use, is the sum of the absolute differences (SAD) although a means square error (MSE) or a normalized cross correlation function (NCCF) are sometimes proposed, see II. THE 3-D RECURSIVE SEARCH BLOCK MATCHER, p. 86) determining the best vectors from the second set of candidate vectors according to said second criterion (II. THE 3-D RECURSIVE SEARCH BLOCK MATCHER, p. 85), and assigning said determined best vectors to a group of pixels that is related to the group of pixels the candidate vectors of the second set of candidate vectors were evaluated for (see II. THE 3-D RECURSIVE SEARCH BLOCK MATCHER, p 86).

Regarding claim 2, De Haan teaches a method according to claim 1, characterized in that the candidate vectors in said first set of candidate vectors (CS) are spatially and/or temporally predicted based on already determined estimated local vectors and/or the zero vector and/or update vectors (Haan discloses where the two option for candidate vector $\underline{C_1}$ alternate on block basis, and the updated vector U(X n) is taken from a limited fixed integer update vector set, see II. THE 3-D RECURSIVE BLOCK SEARCH MATCHER, p. 86).

Regarding claim 3, De Haan teaches a method according to claim 1, characterized in that the local vectors are motion vectors that describe the motion of groups of pixels in pictures of an image sequence (see I. INTRODUCTION).

Regarding claim 4,De Haan teaches method according to claim 3, characterized in that at least one of said motion vectors is predicted according to a parametric 2D global motion model (Haan discloses where the category of camera motion includes motion due to pans, tilts, and travels of the camera, and zooming with its lens. This type of motion usually causes very smooth vector fields in the spatial and in the temporal domain. A zoom with the camera lens results in motion vectors that are linearly changing with the spatial position. A pan, tilt, or travel with the camera, on the other hand, causes uniform motion vector value for the entire television screen. These types of motion can be described with a three parameter model, see I. Introduction p. 85, III. CAMERA MOTION AND THE PARAMETRIC MODEL, *A.A Three-Parameter Model,* and V. Conclusion, p. 90).

Regarding claim 5, De Haan teaches method according to claim 1, characterized in that the local vectors represent sets of parameters that describe the motion model of a group of pixels in pictures of an image sequence (see III. CAMERA MOTION AND THE PARAMETRIC MODEL, *A. A Three-Parameter Model,* p. 87).

Regarding claim 6, De Haan teaches method according to claim 1, characterized in that the local vectors represent spatial features of a group of pixels, in particular texture, dynamic range, color or average value (Haan discloses where zooming with the camera will generate motion vectors that linearly change with the spatial position. Further, Haan discloses where motion can be describe with a three-parameter model, as has been suggested before, using p1 describes the panning, p2 the tilting, and p2 the zooming of the camera, see III. CAMERA MOTION AND THE PARAMETRIC MODEL, *A. A Three-Parameter Model,* p. 87).

Regarding claim 7, de Haan teaches method according to claim 1, characterized in that the second criterion is a match error criterion such as the Sum of Absolute Differences (SAD) criterion, or a mean square error criterion (See II. THE 3-D RECURSIVE SEARCH BLOCK MATCHER, p. 86).

Regarding claim 10, de Haan discloses method according to claim 1, characterized in that the second set of candidate vectors contains at least one extreme and/or one least extreme candidate vector of the first set of candidate vectors according to the first criterion (de Haan discloses where a median operation was introduced to select the applied parameter set, thus eliminating the outliers due to object motion, see V. Conclusion, p. 90-91. Since de Haan discloses to eliminate the outliers, it is clear to the Examiner that method as disclosed by de Haan would include both an extreme and a least extreme vector, which reads upon the claimed limitation).

Regarding claim 13, which recites the corresponding device to the method for recursively estimating local vectors from at least one picture taken from an image sequence. Thus the rejection and analysis made for claim 1 also applies here because the method for recursively estimating local vectors from at least one picture would have necessitated an apparatus to perform the steps of the device as in claim 13.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Haan et al., *An Efficient True-Motion Estimator Using Candidate Vectors from a Parametric Motion Model* in view of Well Known Prior Art (Official Notice).

Regarding claim 8, de Haan is silent in regards to method according to claim 1, characterized in that the selection of candidate vectors from the first set of candidate vectors to form a smaller second set of candidate vectors is based on a ranking of the

corresponding vector components of the candidate vectors in the first set of candidate vectors. However, Official Notice is taken that both the concept and advantage of providing the claimed limitation is notoriously well known and expected in the art, and therefore would have been obvious to incorporate in De Haan for providing improved motion estimation.

Regarding claim 9, de Haan is silent in regards to method according to claim 1, characterized in that the selection of candidate vectors from the first set of candidate vectors to form a smaller second set of candidate vectors is based on a ranking of the candidate vectors in the first set of candidate vectors. However, Official Notice is taken that both the concept and advantage of providing the claimed limitation is notoriously well known and expected in the art, and therefore would have been obvious to incorporate in De Haan for providing improved motion estimation.

8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Haan et al., *An Efficient True-Motion Estimator Using Candidate Vectors from a Parametric Motion Model* in view of Ismaeil et al., *Efficient Motion Estimation Using Spatial and Temporal Motion Vector Prediction.*

Regarding claim 11,De Haan is silent in regards to a method according to claim 10, characterized in that the extreme candidate vectors are the two vectors with the largest distance to the average vector of a number of candidate vectors of the first set of candidate vectors or with the largest distance to a spatial prediction vector in the first set

of candidate vectors, or the longest and the shortest vector, or the largest distance to the rest of the candidate vectors of the first set of candidate vectors.

However, Ismaeil teaches where if the predicted motion vector is far from the optimal motion vector, the motion estimation algorithm will either be trapped in a local minimum or the algorithm will spend many more computations to find the optimum motion vector, see Introduction. Since Ismaeil discloses that the if the predicted motion vector is far from the optimal vector, it is clear to the Examiner that the predicted motion vector far from the optimal vector, would provide a motion vector that is not desirable from the available candidate vectors, which reads upon the claimed limitation.

Thus, it would it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Ismaeil with de Haan for providing improved image coding, see 4. Conclusions.

Regarding claim 12, de Haan is silent in regards to method according to claim 10, characterized in that the least extreme candidate vector is the vector with the smallest distance to the average vector of a number of candidate vectors of the first set of candidate vectors or with the smallest distance to a spatial prediction vector in the first set of candidate vectors, or the vector median.

However, Ismaeil teaches where if the predicted motion vector is close to the optimum motion vector, then the motion vector search algorithm with end after a small number of SAD computations., see Introduction. Since Ismaeil discloses if the predicted motion vector is close to the optimum motion vector, then the motion vector search

algorithm with end after a small number of SAD computations, it is clear to the Examiner that the predicted motion vector close to the optimal vector, would provide a motion vector that is desirable from the available candidate vectors, which reads upon the claimed limitation.

Thus, it would it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Ismaeil with de Haan for providing improved image coding, see 4. Conclusions.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Haan et al., *An Efficient True-Motion Estimator Using Candidate Vectors from a Parametric Motion Model*

Regarding claim 14, Although De Haan is silent in regards to a computer program product directly loadable into the internal memory of a digital computer, comprising software code portions for performing the steps of claim 1 when said product is run on a computer, it would have been obvious to one of ordinary skill in the art that when performing digital signal processing the use a computer program product having stored thereon software.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

11. US-5,072,293

12. US-20040071215

13. US-6947603

14. US-6,996,175

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA ROBERTS whose telephone number is (571)270-1821. The examiner can normally be reached on 7:30-5:00 EST Monday-Friday, Alt Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2621

/Jessica Roberts/
Examiner, Art Unit 2621